

ATTORNEY DOCKET NO.
1114-CA

PATENT

WHAT IS CLAIMED IS:

1. A method of selectively producing comfort noise in a computer network-based telephony system including a transmitting terminal comprising the steps of:
 - sampling background noise local to the transmitting terminal;
 - storing the samples of background noise in a buffer;
 - detecting an echo; and
 - in response to said step of detecting, transmitting the samples of background noise from the buffer onto the computer network.
2. The method of Claim 1 wherein said step of identifying background noise samples local to the transmitting terminal and storing the samples in a buffer.
3. The method of Claim 2 wherein said step of background noise identification is performed in response to voice activity detection.
4. The method of Claim 1 wherein the transmitting terminal transmits active voice data and the background samples in accordance with the Internet Protocol.

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5. The method of Claim 1 wherein said step of detecting an echo comprises the step of detecting echo between a microphone and speaker at the transmitting terminal and said method further comprises the step of:

in response to said step of detecting, selectively switching from an output of the microphone and an output of the buffer.

6. A method of filling a gap between bursts of packets of data transmitted across a computer network comprising the steps of:

storing data samples from a selected one of the packets of a first burst in a buffer associated with a read pointer, the buffer having starting and ending boundaries; and

during a gap between the first burst and a second burst, playing out the stored data from the buffer comprising the substeps of:

retrieving a data sample from the buffer at a randomly selected read pointer value;

incrementing the read pointer value in a selected direction to retrieve next sample from the buffer;

if the read pointer value has reached a one of the starting and ending boundaries, incrementing a rebound count;

if the rebound count has reached a selected value, incrementing the read pointer value in the selected direction to generate at least one subsequent sample until a random stop is reached; and

when the random stop is reached, resetting the rebound count and reversing the selected direction for subsequent read pointer increments.

7. The method of Claim 6 and further comprising the step of reversing the direction of incrementation and incrementing a rebound count if the read pointer value has reached one of the boundaries.

8. The method of Claim 6 and further comprising the steps of:
if the random stop point has been reached after a second rebound,
resetting the rebound count and reversing the direction of incrementation of the
read pointer.
9. The method of Claim 6 wherein the selected packet comprises the last
packet of the burst before dead gap.
10. The method of Claim 6 wherein the burst of packets comprise packets of
voice data and the selected packet comprises a packet of sampled background
noise.
11. The method of Claim 6 and further comprising the step of filtering the data
samples obtained by the dead gap filling method described in Claim 6, to remove
second order discontinuities.
12. The method of Claim 11 wherein said step of filtering comprises the step
of removing second order discontinuities using a single pole low pass filter.

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13. A computer network telephony appliance comprising:
circuitry for sampling background noise local to the appliance;
a comfort noise buffer for storing the samples of background noise; and
switching circuitry for switching an output of the comfort noise buffer to an output of the appliance for transmission of the samples of background noise.
14. The appliance of Claim 13 further comprising circuitry for detecting an echo between a microphone and a sound output device of the appliance and causing the switching circuitry to switch in response.
15. The appliance of claim 13 wherein the circuitry for sampling, the buffer and the switching circuitry form a portion of a personal computer.

16. A computer network telephony appliance comprising:
- a buffer for storing data samples from a selected data packet of a first burst of data packets, said buffer having starting and ending boundaries;
 - circuitry for reading data samples from said buffer during a gap between the bursts of data packets and operable to:
 - retrieve a data sample from the buffer at a randomly selected one of said entries;
 - move in a selected direction through said buffer to retrieve next sample from the buffer;
 - if one of the starting or ending boundaries has been reached, incrementing a rebound count;
 - if the rebound count has reached a selected value, moving in the selected direction through the buffer until a random stop point has been reached; and
 - when the random stop is reached, resetting the rebound count and reversing the selected direction for subsequent read pointer increments

17. The computer network telephony appliance of Claim 16 wherein the circuitry for reading is further to reverse the selected direction through the buffer when a one of the starting and ending boundaries has been reached.

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18. The computer network telephony appliance of Claim 16 and further comprising a filter for removing second order discontinuities from the data samples obtained by dead gap filling method described in Claim 6.